National Park Service
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Crater Lake National Park

Bat Species Acoustic Inventory at Crater Lake National Park

2017 Monument Report



ON THE COVER
Photograph of bat acoustic detector setup on Mount Scott at Crater Lake National Park.

Photograph by Janette Perez-Jimenez.

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This annual report is intended for the timely release of basic data sets and data summaries. Care has been taken to assure accuracy of raw data values, but a thorough analysis and interpretation of the data has not been completed. Consequently, the initial analyses of data in this report are provisional and subject to change.

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Introduction

North American bat species have experienced significant population declines since the first outbreak of white-nose syndrome (WNS) in 2006 which has killed an estimated 6.7 million bats (Cohn 2012). White-nose syndrome is a fungal disease which kills hibernating bats by waking them up from torpor repeatedly, thus reducing their limited fat reserves in addition to causing wing damage, breathing disruptions, dehydration and reduced temperature regulation (Blehert 2008). Prior to 2016, WNS had not been detected west of the Rocky Mountains; however in 2016 there were three cases of WNS confirmed in Washington, marking the spread of WNS into the Pacific Northwest. In addition to disease, bats also face increased mortality risk due to habitat loss and fragmentation, collisions with wind turbines, and climate change (Loeb et al. 2015). These challenges threaten the survival of bat species across North America.

As a result of the perils affecting bats, a continent-wide monitoring program, the North American Bat Monitoring Program (NABat), was implemented by the U.S. Geological Survey to provide guidance for a coordinated and standardized effort to conduct long-term monitoring of bats throughout North America. Once implemented, this program supports our ability to make local, regional and range-wide inferences about trends in bat populations and abundances. In addition, the data can be used to provide managers and policy makers with information needed to effectively manage bat populations, detect early warning signs of population declines, estimate effects of our management actions on bats, and evaluate extinction risk. At a region level, Oregon and Washington have an acoustic monitoring program known as the Bat Grid, which provides further guidance and parameters for acoustic monitoring and was the foundation for the NABat effort.

Comprehensive bat species inventories have never been implemented at Crater Lake National Park (CRLA), however there has been a limited amount of bat research conducted within the Park. The only detailed bat survey occurred in 2005 resulting in the Park's initial bat species list. This survey confirmed the presence of 9 bat species in CRLA (Duff 2005). In 2016, the Park's wildlife team implemented a limited amount of acoustic bat surveys in key bat habitats as part of a pilot study to determine the efficacy of implementing a much larger inventory project. Also beginning in 2016, the Park began a project to examine how wildlife communities respond to a forest restoration project and bats were sampled as part of this effort. Based on the 2016 efforts, three additional species were added to the Park's bat species list (Table 1). Due to the general lack of information regarding bat species presence and distribution within CRLA, this broad scale inventory project was developed to fill a much needed gap in knowledge.

The overall goal for this project is to improve the knowledge about bat species composition and distribution in the Park in order to provide guidance regarding management decisions while contributing to a larger-scale bat monitoring effort. The objectives include:

1) Determine the presence and absence of bat species in Crater Lake National Park.
2) Examine distribution and range of bat species in Crater Lake National Park.
3) Provide guidance to inform park management decision making to limit negative impacts to bat species.

4) Contribute to ongoing regional and national bat monitoring efforts such as NABat and the Bat Grid.

Table 1. Bat species known to occur in in Crater Lake National Park.

Common Name	Scientific Name	Source
Pallid bat*	*Antrozous pallidus*	CRLA 2017
Big brown bat	*Eptesicus fuscus*	Duff 2005
Western red bat	*Lasiurus blossevillii*	CRLA 2016
Silver-haired bat*	*Lasionycteris noctivagans*	Duff 2005
Hoary bat*	*Lasiurus cinereus*	Duff 2005
California myotis	*Myotis californicus*	Duff 2005
Long-eared myotis*	*Myotis evotis*	Duff 2005
Little brown bat	*Myotis lucifugus*	Duff 2005
Fringed myotis*	*Myotis thysanodes*	CRLA 2016
Long-legged myotis*	*Myotis volans*	Duff 2005
Yuma myotis*	*Myotis yumanensis*	Duff 2005
Mexican free-tailed bats	*Tadarida brasiliensis*	Duff 2005

*Listed as Species of Concern under the jurisdiction of the United States Fish and Wildlife Service

In 2017, the focus was on monumenting acoustic survey stations that will be sampled over the next several years as part of the wildlife team's effort to determine presence and distribution of bats in CRLA. A limited amount of acoustic data collection was completed in 2017 to test methods planned for implementation in future years.

Methods

The wildlife team at CRLA selected acoustic monitoring methods to sample bat species within the Park because they are an efficient and effective way to determine bat species presence and distribution. The NABat Grid sampling design was implemented in order to contribute to large-scale and long-term monitoring efforts while determining bat population distribution and occupancy within the Park. The general process for implementing acoustic stations includes: 1) selection of survey area and station locations, 2) acoustic detector deployment and retrieval, 3) data management and 4) acoustic file review. Each of these activities are discussed below and complete details can be found in the CRLA Bat Stationary Sound Station Protocol (Perez-Jimenez and Mohren *in draft*).

Selection of Survey Area and Station Locations

NABat Grid

The NABat Protocol uses a grid-based finite-area sampling design, which encompasses all of North America. One sample grid (100 km^2) is defined by 4-5x5 kilometer (km) cells and assigned a priority number which was randomly selected using a generalized random-tessellation stratified algorithm.

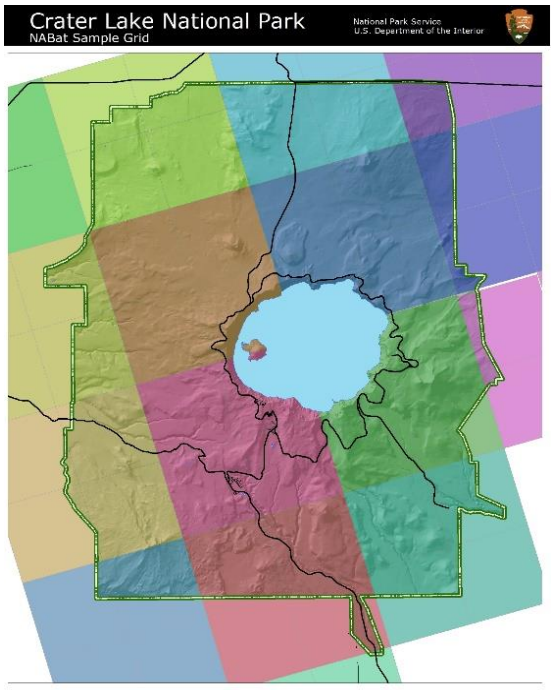


Figure 1. NABat Sample Grid overlaid with Crater Lake National Park border.

There are fourteen sample grids where some portion of the grid lies within the boundary of Crater Lake National Park. In order to meet the requirements of the NABat protocol, at least 2-5x5km cells within each grid must be sampled (Loeb 2015); therefore, any sample grid that did not contain at least 2-5x5km cells within the Park boundary were dropped. This left thirteen sample girds to be included in the long-term monitoring strategy (Figure 1).

Site Selection

Satellite imagery projected in ArcGIS was used to determine a general site location within each of the 5x5km grid cells to deploy the acoustic detectors. Attempts were made to select a site in every 5x5km cell that had some portion of the cell within the Park; this enabled us to meet the Park goals while contributing to both the NABat and the Bat Grid sampling designs. Using ArcGIS, the landscape was analyzed at a broad scale and locations selected within each grid cell that were expected to contain a higher concentration of bat species (Figure 2). Within each sample grid, we sought to include a diversity of sites based on key habitat features (e.g. talus slopes), vegetation type, and topographic features that may funnel bats to specific locations. Vegetation types focused on the four dominant habitat types as defined by the Park's current

vegetation map, which is based on Pacific Meridian data (1996). Habitat types included the vegetation alliances Mediterranean California Red Fir Forest, Mediterranean California Mesic Mixed Conifer Forest and Woodland, Northern Pacific Mountain Hemlock Forest, and Northern Rocky Mountain Ponderosa Pine Woodland and Savanna. Attempts were made to maintain a similar proportion of sites within each vegetation alliance that mirrored the percent composition of each type within the Park. Other considerations included accessibility to the site and ensuring a low probability of the acoustic detector being observed by visitors.

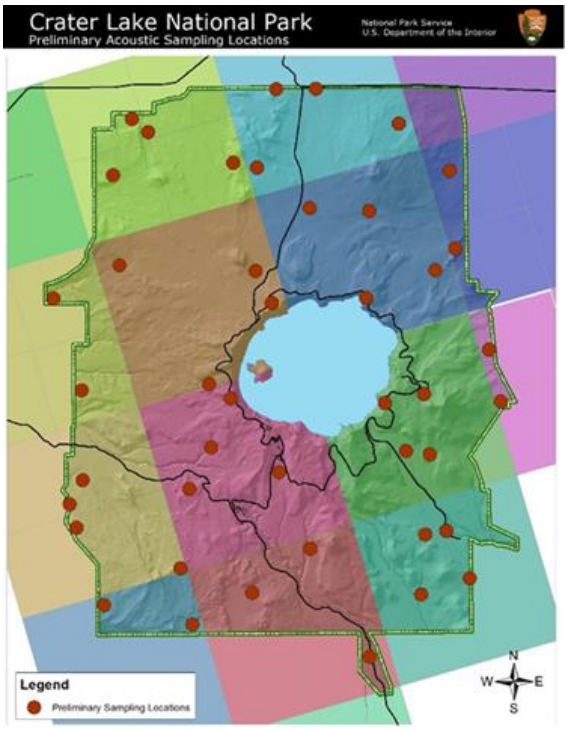


Figure 2. Preliminary acoustic sampling locations at Crater Lake National Park

After selecting locations using ArcGIS, crews visited the sites to verify that the location had features that suggested potential bat use. If a site did not have these features, or if it was determined a different nearby site had greater potential for bat detections, the site was relocated. At each of these locations, photographs were taken of the site, habitat types and topographic features were documented, GPS coordinates were recorded, and directions to the site were noted.

Acoustic Detector Deployment and Retrieval

Over the next few years, the Pettersson D500X Ultrasound Detectors will be utilized to record bat echolocation calls for a minimum of four nights at the selected site locations, as recommended by the NABat protocol. At each of these sites, a high-frequency microphone is positioned atop a three to four meter pole that connects to the acoustic detector and is stabilized using natural features such as logs, trees, or rocks. Microphones can be weather proofed using PVC if needed and orientated towards the most open area or the area of interest (i.e. water sources). Microphones are deployed using directional cones where applicable to focus recordings towards a given direction.

Acoustic monitors record 15 minutes before sunset and 15 minutes after sunrise to ensure times of high activity are adequately sampled. A sampling frequency of 300 kHz, input gain of 70dB, trigger level of 120dB, trigger sensitivity of medium, recording length of 5 seconds and interval of 0 seconds is programed on the detector in order to obtain the highest quality sound files which take into account the densely forested environment. Given the potential for detecting very low frequency bats such as the spotted bat (*Euderma maculatum*), the high-pass filter is turned off to allow their calls to trigger the recorder.

Potential noise caused by vehicles, humans, water, and/or cicadas were identified during the site monumenting process and pictures were taken facing each cardinal direction to document changes in vegetation and habitat structure throughout the longevity of this sampling effort.

During the survey period, weather data is collected by CRLA's weather station that records minimum and maximum relative humidity, wind speed, temperature and rainfall on an hourly basis. Averages are calculated for each survey night, which is defined as the time between sunset and sunrise on the following calendar day. Nights are omitted from the survey if inclement weather persists, which includes rain, high wind speeds, or cold nights that were near freezing temperatures. In these cases, the detectors remain out long enough to ensure at least four nights of data collection occur.

Once the minimum 4 night sampling requirement has been met, detectors are retrieved from the field when time permits, often leading to additional nights of sampling. During the retrieval process, the date and time of the detector recovery are documented, notes made on the functionality of the battery, microphone, detector, and setup are recorded, and additional notes relevant to the collection of the data are taken if necessary.

Data Management

Once the detectors are in from the field, the acoustic data is downloaded onto the Park's server and subjected to the Park's data backup procedures. Two copies of the data are created; one is stored in a "working" folder and one is saved in a "raw data" folder. The raw data folder contains an original copy of the acoustic files that are used as a backup and are not manipulated; the working folder contains a copy of the data that is used for analysis and eventually species identification.

Datasheets are double checked for accuracy and data from the weather stations are added to the datasheets. Once complete, the datasheets are scanned and saved as a PDF document on the Park's server; original datasheets are archived.

Sound Review

Sound files are downloaded and sifted into two categories, bat and non-bat calls, using SonoBat 4.0.7 bat call analysis software (Szewczak 2016). The calls that were identified as bat calls by SonoBat were identified using the auto-classifier feature. Identification thresholds to be met for auto-classification include an acceptable call quality at or above 0.80, and a sequence decision threshold at or above 0.90 for Eastern Oregon bat species.

For calls not identified to species by the Sonobat software with the specified confidence, calls were reviewed manually using parameters detailed in the Echolocation Call Characteristics of Western US Bats (Szewczak et al. 2011). For each call where the Sonobat software species reached at least a discriminant probability level of 0.75, even if the sequence did not reach any other level of decision, the call was manually reviewed to determine species presence. If the species could not be determined, it was classified into a broader category as detailed in Table 2. Table 3 provides the scientific and common names and species codes for bats that are suspected to occur in CRLA and utilized as part of the review process.

Table 2. Bat call identification category names and descriptions.

Identification Category	Category includes
40KMYO	Myyu, Myca, Myci, Myvo, Mylu
40KHZ	Myyu, Myca, Myci, Myvo, Mylu, Pahe, Labl
LOFREQ	Anpa, Epfu, Lano, Myev, Myth, Coto, Tabr, Laci
UNKN	Potential bat call present, unable to determine due to excessive clutter
NULL	Calls that are identified as non-bat species vocalizations

Table 3. Common and scientific names of bat species that are suspected to occur in or near Crater Lake National Park along with their unique species code identifier.

Identification Category	Scientific Name	Common Name
Anpa	*Antrozous pallidus*	Pallid bat*
Coto	*Corynorhinus townsendii*	Townsend's big-eared bat*
Epfu	*Eptesicus fuscus*	Big brown bat
Euma	*Euderma maculatum*	Spotted bat*
Lano	*Lasionycteris noctivagans*	Silver-haired bat*
Labl	*Lasiurus blossevillii*	Western red bat
Laci	*Lasiurus cinereus*	Hoary bat*
Myca	*Myotis californicus*	California myotis
Myci	*Myotis ciliolabrum*	Small-footed myotis*
Myev	*Myotis evotis*	Long-eared myotis*
Mylu	*Myotis lucifugus*	Little brown bat
Myth	*Myotis thysanodes*	Fringed myotis*
Myvo	*Myotis volans*	Long-legged myotis*
Myyu	*Myotis yumanensis*	Yuma myotis*
Pahe	*Parastrellus Hesperus*	Western pipistrelle
Tabr	*Tadarida brasiliensis*	Mexican free-tailed bats

*Listed as Species of Concern under the jurisdiction of the United States Fish and Wildlife Service

Results

Monumenting Sites

During the 2017 field season, crews visited 24 of the 43 sites and documented site descriptions and justifications for selecting each location (Figure 3). Overall each of the selected sites was relatively accessible, allowing for quick deployment as time allowed during the field season. Since this project has no long-term funding support, sites were selected that can be surveyed in a short amount of time. Of the sites visited, the average hiking time for an individual to get to a site was an hour and 22 minutes, with a minimum hike time of 7 minutes and maximum hike time of 3 hours and 56 minutes.

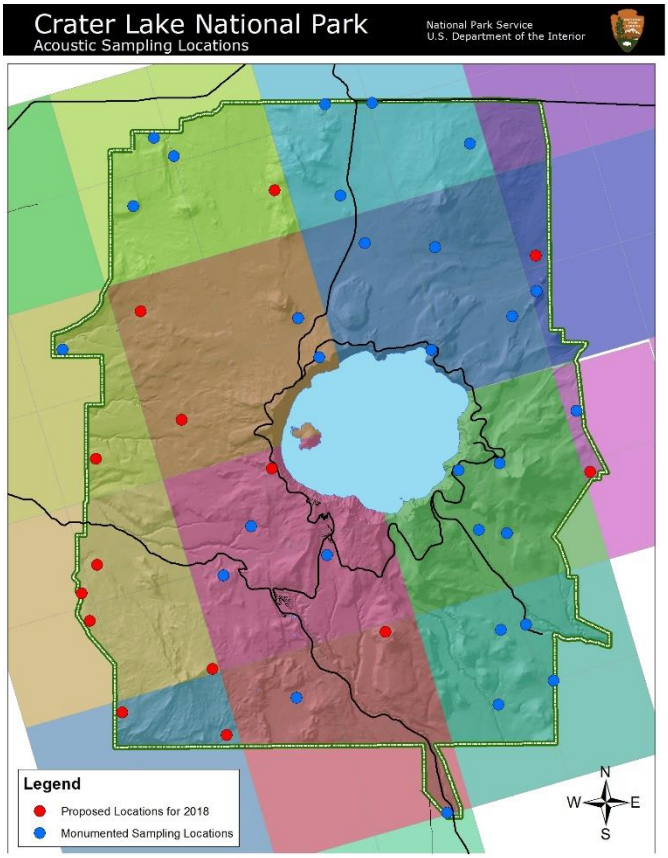


Figure 3. Bat acoustic sites that were monumented in 2016 and 2017 along with sites planned for monumenting in 2018.

In addition to these 24 sites, 5 sites were monumented in 2016 as part of a separate project but were included in this sampling design. In total, 29 of the 43 sites have now been reviewed and monumented (Figure 3).

Fourteen sites were not sampled in 2017 due to safety issues related to two large wildfires (Spruce Lake and Blanket Creek) that persisted in the Park for most of the summer and precluded access to many of the remaining locations. Time constraints due to higher priority tasks such as compliance surveys for Threatened and Endangered species also prevented us from monumenting and sampling more sites in 2017.

Site Overview

Below is a brief synopsis of each site that was monumented in 2016 or 2017. Sites 11921C, 37777D, 71620C, 79984B, and 82075C were monumented during the 2016 bat pilot study; all other sites were monumented in 2017.

11921A – Not monumented this year due to wildfire. Location selected due to springs located nearby.

11921B- Located south of Red Cone, where a natural break in the forest occurs, focusing on a topographic feature which bats would utilize as they potentially go around Red Cone. Located near the forest edge which transitions to an open pumice field.

11921C- Located on Llao Rock, close to the edge of the caldera which provides foraging and roosting habitat.

11921D- Not monumented this year due to wildfire. Area selected due to springs located nearby.

21393A- Located near Boundary Springs, selected due to its proximity to streams. Location is in a drainage which maintains moisture, providing potential food source for bats, in addition to the various large snags which could serve as roosts for forest bats.

21393B- Located near Boundary Springs, selected due to its proximity to streams. Location is near boundary springs headwaters, near a drainage which maintains moisture, providing potential food source for bats, in addition to the various large snags which could serve as roosts for forest bats.

21393C- Not monumented this year due to wildfire. Area selected due to location topographically, the proposed location sits on top of the lowest part of a ridge which then transitions to the Pumice Desert.

21393D- Located on Crescent Ridge, selected due to ridge which bats could travel down to get to potential water source located in the Rogue River National Forest.

28305A- Not monumented this year due to wildfire. Location selected due to springs located nearby. Small portion of this grid cell lies in CRLA, resulting in limited site options.

28305B- Not monumented this year due to wildfire. Location selected due to springs located nearby.

28305C- Not monumented this year due to wildfire. Location selected due to springs located nearby. Small portion of this grid cell lies in CRLA, resulting in limited site options.

28305D- Not monumented this year due to wildfire. Location selected due proximity to talus slope, which could provide roosting habitat.

37777A- Located in the northern portion of the Park, near a lodgepole pine stand and along the edge of a burn. Small portion of this grid cell lies in CRLA, resulting in limited site options.

37777B- Located in the northern portion of the Park. Small portion of this grid cell lies in CRLA, resulting in limited site options.

37777C- Located in the northeast portion of the Park, near Gaywas Peak. Selected based on topographic features which could potentially funnel bats.

37777D- Located on the edge of Pumice Desert where a dip in the surrounding peaks occurs, and where there are “islands” of trees for bats to utilize to avoid predation.

40593A- Not monumented this year. Location selected due to forest edge along barren landscape.

40593D- Located in the northeast portion of CRLA between two peaks. The peaks could potentially act as funnels for bats travelling east to west. Site also near a rocky slope which could serve as a roost site.

48785A- Located in the eastern portion of the Park near a creek fork along an old fire road that acts as a flyway.

48785B- Located in the eastern portion of the Park near Sand Creek, site is along a forest edge leading into a clearing.

48785C- Located in the eastern portion of the park along the base of Maklaks Crater, which could funnel bats passing along the edge. Small portion of this grid cell lies in CRLA, resulting in limited site options within the Park.

48785D- Located near Sun Creek, selected due to water source and meadow habitat in a relatively flat stretch of area with long flyways.

56977A- Located in Pumice Desert where it meets the forest edge.

56977B- Located south of Timber Crater, in a relatively flat area surrounded by a lot of topographic variation.

56977C- Located in an area with a woodland and chaparral habitat along a forest edge.

56977D- Located along the caldera, which provides foraging and roosting habitat.

61073A- Not monumented this year due to wildfire. Small portion of this grid cell lies in CRLA, resulting in limited site options within the Park.

61073B- Not monumented this year due to wildfire. Located in the southwest portion of CRLA, selected due to proximity to Stuart Falls.

71620A- Located near Dutton Creek, off of the Pacific Crest Trail. Site selected due to proximity to moving water, in an open area along the forest edge.

71620B-Not monumented this year due to wildfire. Small portion of this grid cell lies in CRLA, resulting in limited site options.

71620C- Located along sewage ponds, which are stagnant and a consistent source of water.

71620D- Located near Whitehorse Ponds in an open meadow.

79984B- Located along Spruce Lake, which is a stagnant body of water surrounded by forest.

79984C- Not monumented this year due to wildfire. Selected due to proximity to water source, and a natural break in the densely vegetated forest.

82075A- Located south of Bear Bluff in a flat, along forest edge in an open area surrounded by many peaks, and topographic complexity.

82075B- Located west of Crater Peak, near East fork of Annie Creek. Selected due to proximity to water source and along hillside. When selecting this location in the field, we moved the site to a spot recommended as a good bat use area by the field crew, however upon further review the site is now located outside the grid cell and will need to be moved to a new location.

82075C- Located in the Panhandle at the South Yard. Selected because of the open area at the maintenance yard which likely acts as a flyway for bats using the surrounding dense forest.

86256A- Located near Pothole Creek, selected due to habitat edge between mixed conifer and barren habitat. Site also provided lots of snags due to previous fire for tree roosting bats.

86256D- Not monumented this year. Location selected due to topography that may funnel bats into this area.

94620A- Located along East Rim Drive, selected due to proximity to caldera in addition to the meadow/ forest edge habitat. Location also selected due to accessibility for potential public bat mist netting.

94620B- Located along the base of Mt. Scott along a forest edge within close proximity of the caldera.

94620C- Located near the old Anderson Bluff fire road, selected due to barren/ mixed conifer forest edge in addition to close proximity to water source. Site also provided large snags for potential roosting sites.

94620D- Located near the old Anderson Bluff fire road, selected due to proximity to water source.

Sound Review

Crews sampled grid cell 94620, located on the east side of CRLA, in early September. Bat calls were identified using SonoBat's auto-classifier feature. Confidently identified species in this grid cell include big brown bat, silver-haired bat, long-legged myotis, small-footed myotis, and California myotis (Table 4). Sites 94620A through D recorded 144, 2887, 159, and 70 calls, respectively, which is the total number of calls that the SonoBat program identified as having bat call characteristics. Other factors such as microphone position, clutter, insect noise, wind, relative humidity and detector placement can affect the quality and quantity of calls recorded. In total, at site 94620 A through D 235, 4713, 242, 128 recordings were documented, respectively, however as shown above many of these were classified as not being bats.

Table 4. Bat species present in NABat grid cell 94620 during the 2017 sampling event along with other bats that were not detected but are likely to occur in Crater Lake National Park.

	Myyu	Myca	Myci	Myvo	Mylu	Myev	Pahe	Anpa	Epfu	Lano	Coto	Myth	Tabr	Laci	Euma
94620A		X	X												
94620B					X	X				X				X	
94620C									X	X					
94620D				X						X					

Discussion

Site Selection Considerations/ Limitations

One of the main goals of 2017 was to visit all 43 acoustic sampling locations of this bat inventory project to confirm the suitability of each site and to monument it for future sampling. Unfortunately, a late snowmelt and two large wildfires (Blanket Creek and Spruce Lake) prevented us from reaching this objective. In 2018, the focus for this project will be assessing and monumenting the remaining 14 sites.

A few grid cells in the western portion of CRLA were concentrated either at the park border or along West Rim Drive to facilitate accessibility. This resulted in a large gap on the west side of the Park at the mid-elevation range that will remain unsurveyed for bat species. Due to inconsistent funding sources for this project, locations were selected to reduce staff travel time while at the same time containing key features that may attract bat activity. Since the initial site selection, we have identified a few alternate site locations for two cells (11921D and 28305B) which would reduce site congestion and increase sampling efforts in the mid-elevation range of the Park (Figure 4). The alternate site for 11921D is approximately 3.5 kilometers away from the previously proposed site, making this an 8 kilometer round trip hike. The alternate site for 28305B is approximately one kilometer away from the previously proposed site, making this a three kilometer round trip hike.

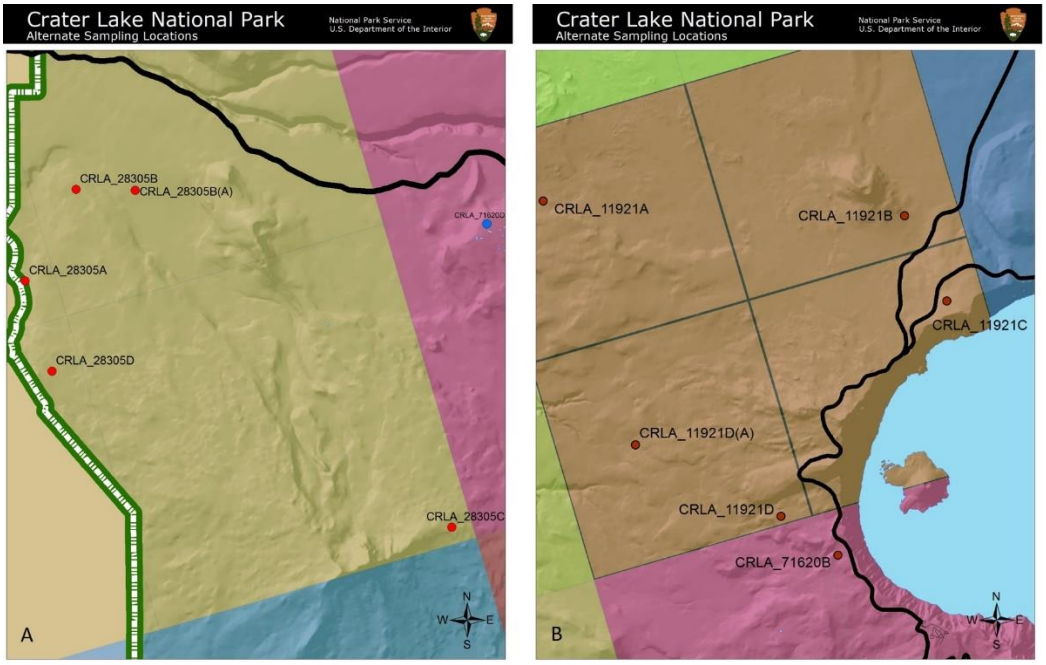


Figure 4. Recommended alternate sites to ensure sampling at mid-elevations for A) 11921D and B) 28305B.

NABat Protocol and Oregon Bat Grid

The data collected in 2017 meets the criteria to contribute to both larger-scale bat monitoring efforts, NABat and the Bat Grid. The main difference between the two protocols is the survey duration and number of grid cells surveyed. NABat recommends four nights of sampling at two of the four 5x5 km grid cells while the Oregon Bat Grid requires one day of sampling at all four 5x5 km cells. Other

differences include detector settings; NABat does not have setting preferences defined, and the Bat Grid has specific detector settings which currently vary from those described in the CRLA bat sampling protocol. Detector settings used in bat surveys were selected to enhance battery and memory efficiency to effectively capture bat activity within CRLA. Given the high risk of recording distorted calls in CRLA's dense forest it was imperative that we lower the trigger level and increase the gain. The benefits and disadvantages of altering detector setting requirements in the CRLA protocol will be reviewed to make certain the data are compatible with the Bat Grid project.

Future Data Processing and Analysis

Manually vetting each sound file can quickly become time consuming depending on the number of files recorded and the skill set of the reviewer, which will likely vary from year to year. The time put into manually classifying each call and then potential identifying a missed species are not weighted equally. It is recommended that in future years the auto-classifying capabilities of SonoBat be used to identify each call to species. For species that did not get classified with a high degree of certainty, records should be manually vetted until each unique species is identified. Once a species is confirmed to be present, remaining calls for that species will not be vetted. This will likely leave a significant amount of calls unidentified; however, it will still meet the objectives of this project. In the unlikely event a species is missed, repeated surveys of the site over time should eventually document the missed species. Since this project is assessing occupancy, the number of times a certain species is detected is not necessary.

Potential Future Efforts

Determining Site Variation

The main objective of this project is to determine the presence and distribution of bat species within Crater Lake National Park. To ensure the results of this project are accurate, understanding the annual and interannual variation in bat species presence will be needed. Sampling the same acoustic station multiple times in a single season and sampling a grid cell multiple years in a row will provide some much needed information to help determine the likelihood that a species is being missed at any given time point in the summer and on any given year.

Subsampling Grid Cells

The Park contains several unique areas of habitat that, while not necessarily representative of CRLA vegetation, still possess opportunities for newly identified bat species. Since these locations are not representative of a dominant vegetation type at CRLA as a whole they were not selected to be a part of the main survey sites. A few examples of potential bat use areas that are not captured in this project include locations such as the Wizard Island boat houses and the Wine Glass shelter (potential artificial bat roost habitat); various aspen stands that occur throughout the Park; and talus outcrops and caves along the outside of the caldera. These sites should be identified and opportunistically sampled as time allows to ensure no critical areas of bat use are being missed.

Winter Surveys

While most bat monitoring efforts focus on summer surveys to document the most active time of the year for bat species, this also means that potential winter roost locations may be left undocumented.

This has resulted in limited winter records of bat species (Perkins et al. 2005). Given the roost tree preferences and migration patterns of larger bat species like the hoary bat, it seems probable that bats may overwinter in the closed canopy, old-growth forests of CRLA (Weller et al. 2016, Willis and Brigham 2005). It is recommended that sampling efforts be implemented during winter months to document areas that maybe important to potential over-wintering bat populations at CRLA.

Mist Netting

Some of the smaller bat species in CRLA are more difficult to detect acoustically since their echolocation call characteristics have significant overlap. Additionally, CRLA is predominately composed of dense vegetation, which results in bat species changing their call structure to be effective in a cluttered area - this can make species difficult to identify. Mist netting can provide the opportunity to confirm species presence, but more importantly for the CRLA wildlife team, mist netting provides the opportunity to record voucher bat calls that can be used to increase the Park's internal call library which would document local call variation and assist in call identification.

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